Safety Precautions

The following is a listing of safety precautions which must be observed when operating this equipment. Observance of these safety precautions will minimize the risk of personal injury. Carefully read this list of safety precautions before operating the sterilizer.

WARNING: BURN HAZARD

When attempting to sterilize liquids, to prevent personal injury resulting from bursting bottles and hot fluid, the following procedures must be followed:

- Use liquid preconditioning only. No other preconditioning is safe for sterilizing liquids.
- Use only vented closures.
- Only use glass bottles designed for sterilization.
- At completion of cycle, avoid jolting bottles; this can cause hot-bottle explosions. Do not move bottles if any boiling or bubbling is present.

Sterilizer and rack/shelves will be hot after cycle is run. Always wear protective gloves and apron (also face shield if processing liquids) when removing a sterilized load.

A steam supply malfunction may cause the sterilizer to fill with hot scalding water. Do not open the chamber door if water leaks past the door gasket upon completion of the cycle.

WARNING: EXPLOSION HAZARD

The sterilizer is not designed to process flammable compounds.

WARNING: PERSONAL INJURY HAZARD

To prevent falls, keep floors dry by wiping up any spilled liquids or condensation in sterilizer loading or unloading areas.

When closing the chamber door, keep hands and arms out of the door opening, and make sure opening is clear of any obstructions.

Before entering chamber for cleaning, turn main power switch to the OFF position.

WARNING: STERILITY ASSURANCE HAZARD

Load sterility may be compromised if the biological indicator or air leak test indicates a potential problem. If these indicators indicate a potential problem, contact a qualified service technician before using the sterilizer further.

Section 1: Component Identification

Use this section of the manual to become familiar with the locations of controls and functions before operating the sterilizer.

1.1 Sterilizer Control Valves and Switches

Water Supply Valve: (Refer to Figure 1-1) This valve is located in the maintenance room, behind the service access door. Verify that this valve is in the open position before operating the sterilizer.

Steam Supply Valve: (Refer to Figure 1-2) This valve is located in the maintenance room, behind the service access door. Verify that this valve is in the open position before operating the sterilizer.

Main Power Disconnect Switch: (Refer to Figure 1-3) Located in the maintenance room, behind the service access door, in the terminal box, this switch disconnects power to the control. The switch is on at all times under normal operation.

Control Touch Screen: (Refer to Figure 1-4) Located on the control touch screen when the sterilizer is in Standby Mode. When the ON touch pad is pressed, the sterilizer will enter into the Main Menu for Operating Mode.

Steam Generator Control: If the sterilizer is equipped with an integral electric steam generator it will be located below the sterilizer chamber. The generator will automatically be turned on by the sterilizer's control when the ON touch pad is pressed. Refer to the generator's manual for further control information relating to it.

PHOTO NOT AVAILABLE

Figure 1-1 Water Supply Valve

PHOTO NOT AVAILABLE

Figure 1-2 Steam Supply Valve

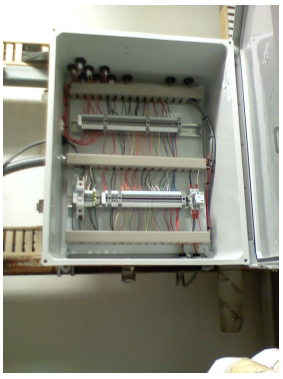

Figure 1-3 Main Power Switch

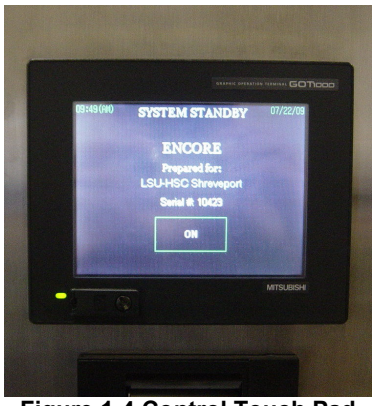

Figure 1-4 Control Touch Pad

Section 2: Control Screens

Use this section of the manual to become more familiar with the control screens of the sterilizer. **NOTE:** Screen touch pads respond to slight pressure and only need to be pressed lightly. Pressing touch pads too aggressively can cause damage to the touch screen.

2.1 General Information

There are two types of control screens. Screens which are present when the sterilizer is “out-of-cycle” and those which are present when the sterilizer is “in-cycle”. Both types of screens have status bars which tell the operator the chamber temperature, jacket temperature, chamber pressure, door status and alarm status.

Out-of-cycle Screens: These screens are used to set up and adjust sterilizer operation or start cycles. Most “out-of-cycle” screens, except for cycle starting screens, are only used occasionally. Most “out-of-cycle” screens have a status bar (refer to figure 2-1). There are 4 possible status conditions for “out-of-cycle” screens.

1. **Not Ready – Jacket Charge:** This status indicates the jacket temperature has not yet reached the Jacket Ready Setpoint. The status will remain in this condition until the setpoint is achieved.
2. **Not Ready – Close Door:** This status condition means that the Jacket Ready Setpoint has been achieved and the door needs to be closed in order to begin a cycle.
3. **Ready to Start:** This status condition means that the Jacket Ready Setpoint has been achieved and the door is closed. The sterilizer is ready to begin a cycle.
4. **SYSTEM ALARM:** This status condition means that the control is under an alarm condition. The alarm condition must be cleared in order to begin a cycle.

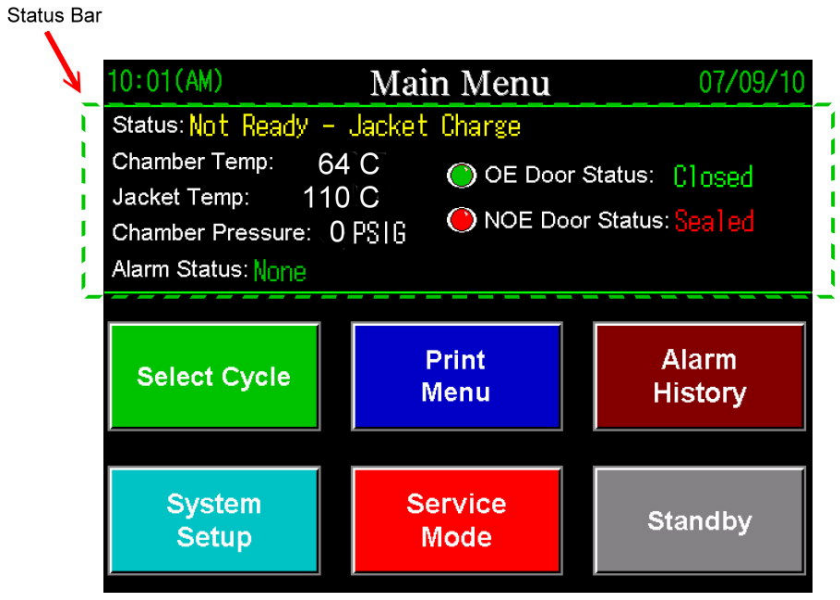

Figure 2-1

In-cycle screens: For the most part, "in-cycle" screens appear automatically and require no special attention or instructions. "In-cycle" screens notify the operator of the cycle parameters and the current phase, temperature and pressure of the cycle. All "in-cycle" screens have a status bar. The status bar for "in-cycle" screens reflect what phase the cycle is in and how much time has elapsed for that phase (refer to figure 2-2).

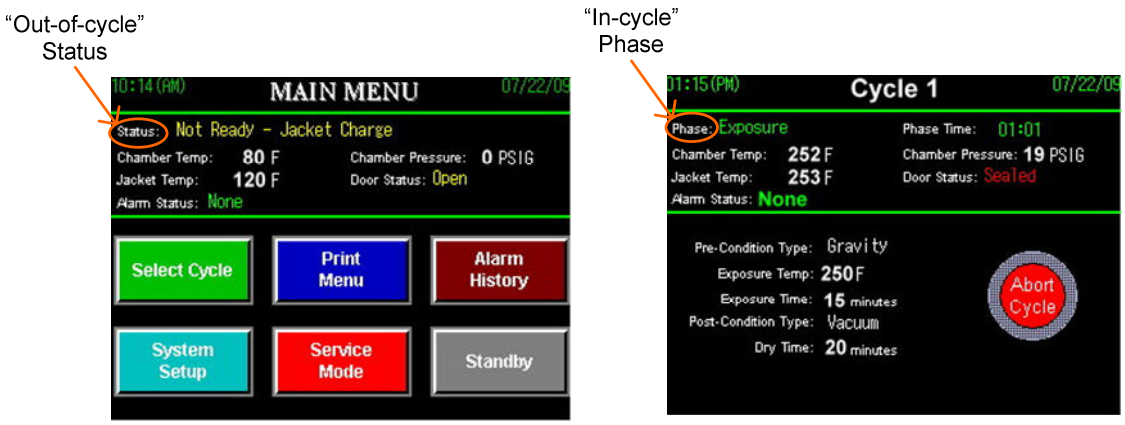

Figure 2-2

2.2 Main Menu

The Main Menu (figure 2-1) is the first screen to appear when the "ON" touch pad is pressed on the Standby screen. There are six touch pads on the Main Menu.

1. **Select Cycle:** Pressing the select cycle touch pad will take the user to the "Select Cycle Menu". There the user is able to select one of eight different configurable cycles.
2. **Print Menu:** Pressing the print menu touch pad will take the user to the print menu where the user will be able to print the previous cycle report or set up the printer settings.
3. **Alarm History:** Pressing the alarm history touch pad will take the user to a screen displaying all recent alarms.
4. **System Setup:** Pressing the system setup touch pad will take the user to the system setup menu as long as they have at least maintenance level access. A password will be asked for upon touching the system setup pad.
5. **Service Mode**: Pressing the service mode touch pad will put the sterilizer in that mode as long as the user has at least maintenance level access. A password will be asked for upon touching the service mode pad.
6. **Standby:** Pressing the standby touch pad will take the sterilizer out of operation and into standby. If the unit is equipped with an integral electric steam generator, the generator will be turned off.

2.3 Print Menu

The Print Menu (figure 2-3) can be accessed from the Main Menu only. When the user enters the Print Menu, they are offered with 3 options.

1. **Print Previous Cycle Report:** Pressing the print previous cycle report touch pad will cause the printer to print a copy of the most recent cycle report.
2. **Printer Settings:** A password will be asked for upon pressing the printer settings pad. The user must have at least maintenance level access to proceed to the printer settings screen. There are 3 possible printer settings.

a. **Ask to Print:** After the door is opened, the user will be asked if they wish to print a cycle report. This feature is not available on all units.
b. **Always Print:** A cycle report is automatically printed after the door is opened.
c. **Never Print:** A cycle report is only printed by going to the Print Menu and selecting to print previous cycle report.

3. **Main Menu:** Pressing this pad takes the user back to the Main Menu.

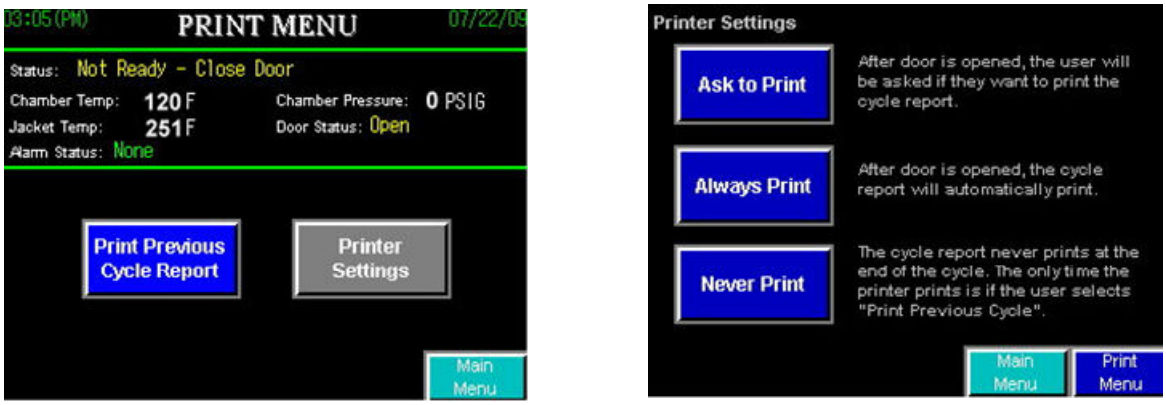
03:05(PM)
PRINT MENU
07/22/09
Status: Not Ready - Close Door
Chamber Temp: 120 F
Chamber Pressure: 0 PSIG
Jacket Temp: 251 F
Door Status: Open
Alarm Status: None
Print Previous Cycle Report
Printer Settings
Main Menu
Printer Settings
Ask to Print
After door is opened, the user will be asked if they want to print the cycle report.
Always Print
After door is opened, the cycle report will automatically print.
Never Print
The cycle report never prints at the end of the cycle. The only time the printer prints is if the user selects "Print Previous Cycle".
Main Menu
Print Menu

Figure 2-3

2.4 Select Cycle Screen

The select cycle screen (figure 2-4) is where the user can select from 8 user configurable cycles. Each cycle can be pre-programmed and named with an 8 character name that is also displayed above the cycle touch pad. The user has 4 options at this screen.

1. **Cycle 1 – 4:** Pressing any of the 4 cycle touch pads will advance the user to the cycle start screen for the selected cycle.
2. **More Cycles:** Pressing the more cycles touch pad will advance the user to the next 4 cycles available to the user.
3. **Main Menu:** Pressing this pad takes the user back to the Main Menu.
4. **Standby:** Pressing the standby touch pad will take the sterilizer out of operation and into standby. If the unit is equipped with an integral electric steam generator, the generator will be turned off.

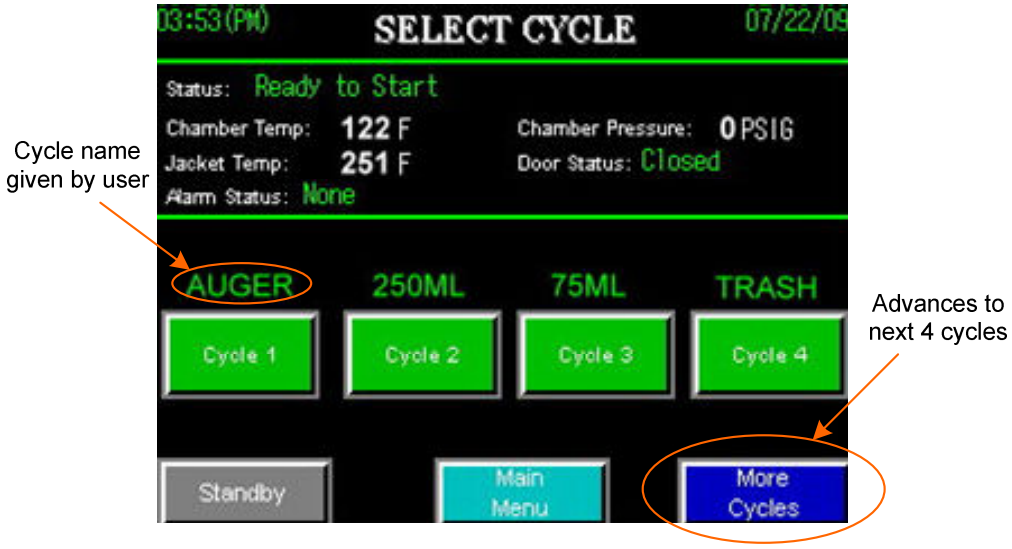

Figure 2-4

2.5 Start Cycle Screen

The start cycle screen (figure 2-5) is where the user can initiate or change the parameters and name of the cycle. A password is required, with at least maintenance level access, to change cycle parameters and name the cycle.

1. **Start Cycle:** Pressing the start cycle touch pad will initiate the cycle using the cycle parameters listed.
2. **Cycle Menu:** Pressing the cycle menu touch pad will take the user back to the select cycle screen.
3. **Change Values:** A password will be asked for upon touching the change values touch pad. The user must have at least operator level access in order to change the values of the cycle.

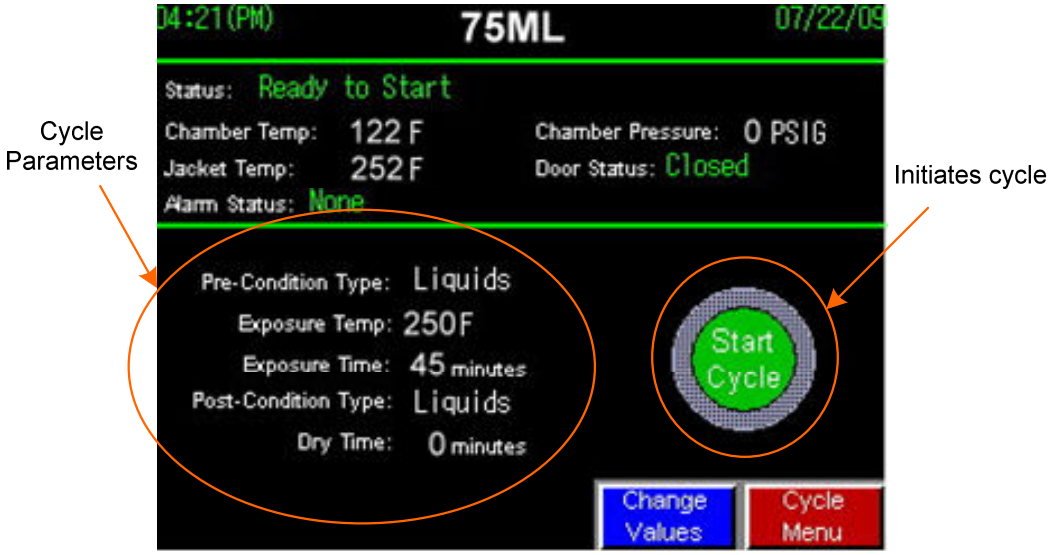

Figure 2-5

2.6 Changing Cycle Values

Upon touching the change values touch pad, a password will be asked for. If the user has at least operator level access, they will be presented with the Cycle Settings screens (figure 2-6, 2-6.2, 2-6.2). The user can cycle through the three screens using the blue arrow touch pads. Any value that is green can be changed simply by touching that value. The user can exit the cycle settings screens at any time without changes being saved by pressing the cancel touch pad. To save changes made, the user must touch the save touch pad on the final cycle settings screen.

1. **Pre-Conditioning Type:** To select a pre-conditioning type, touch the touch pad next to the desired pre-conditioning. The selected type will turn red.
2. **Vacuum Pulses:** Touch the green number to change the value. If Gravity or Liquids pre-conditioning have been selected, the value will automatically be set to 0.
3. **Setpoints:** Touch the green numbers to change the values. If Gravity or Liquids pre-conditioning have been selected, the values will automatically be set to 0.
4. Use the blue arrow touch pad to advance to the next cycle settings screen or cancel to exit the cycle settings screens.

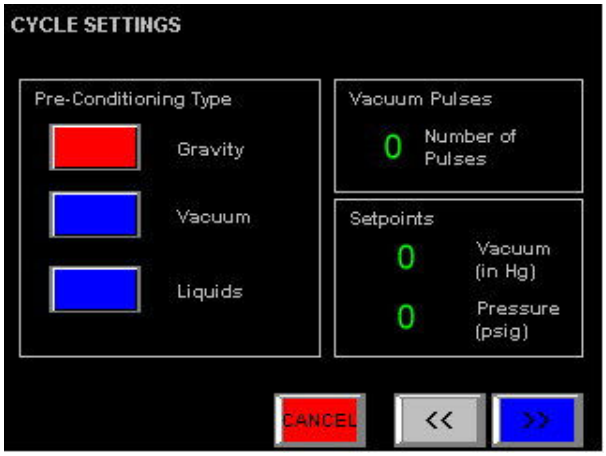

Figure 2-6

1. **Timers:** Touch the green numbers to change the values to the desired levels.
2. **Setpoints**: Touch the green number to change the value to the desired exposure temperature leve.
3. Use the blue arrows touch pads to advance to the next screen or go back to the previous screen. Use the cancel touch pad to exit the cycle settings screens without changes being saved.

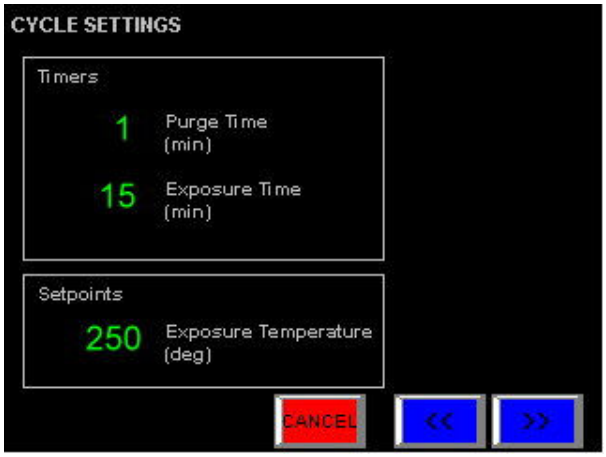

Figure 2-6.1

1. **Post-Conditioning Type:** To select a post-conditioning type, touch the touch pad next to the desired post-conditioning. The selected type will turn red.
2. **Timers:** Touch the green number to change the value to the desired level.
3. **Cycle Name:** Touch the green characters to change the cycle name. The cycle name can be no more than 8 characters.
4. Use the Save touch pad to save your cycle configuration and ext the cycle settings screen.
5. Use the blue arrow touch pad to go back to the previous screen.
6. Use the Cancel touch pad to exit the cycle settings without saving changes.

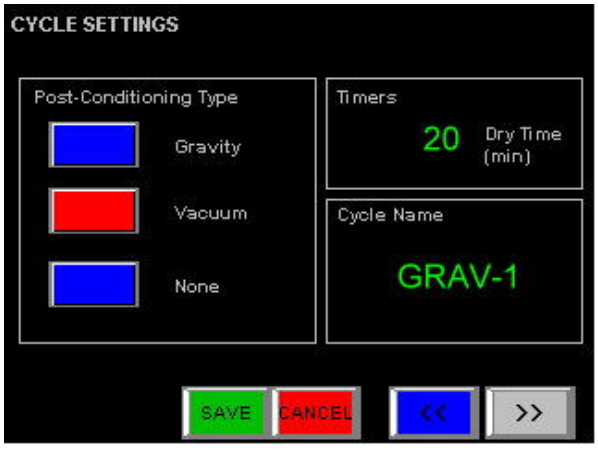

Figure 2-6.2

2.7 Cycle Run Screen

The cycle run screen (figure 2-7) is an “in-cycle” screen that is automatically displayed when the user initiates a cycle. The status bar displays the phase the cycle is in along with the amount of time that has elapsed for that phase, along with the current jacket temperature, chamber temperature and chamber pressure.

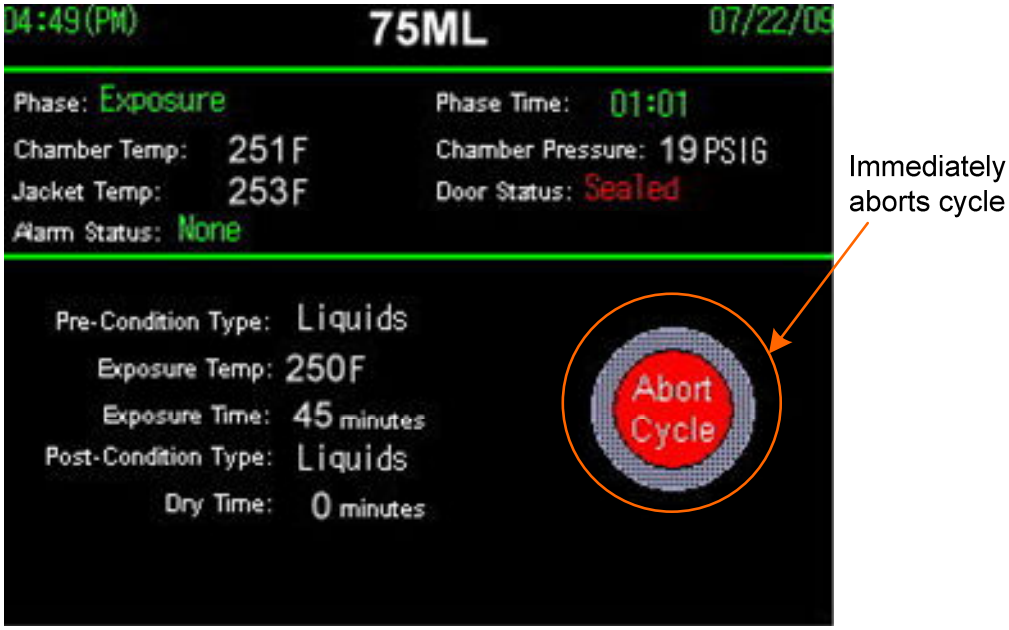

Figure 2-7

2.8 Cycle Complete Screens

The cycle complete screen (figure 2-8) is displayed automatically when the cycle has completed. The screen notifies the user that to wait 10 minutes while the chamber vents. A countdown clock is enabled to let the user know how much time is left before they may safely unload the unit. After the 10 minutes has elapsed, the screen will notify the user and give further on screen instructions for unloading (figure 2-8.1).

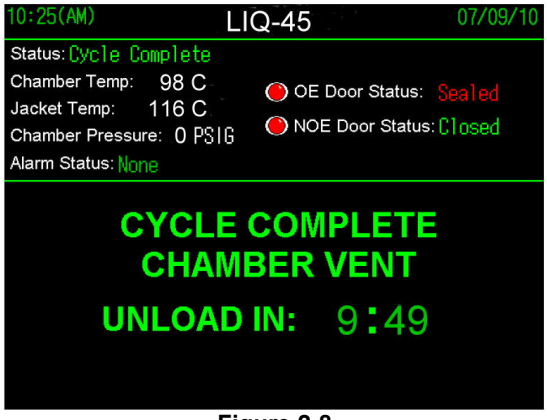

Figure 2-8

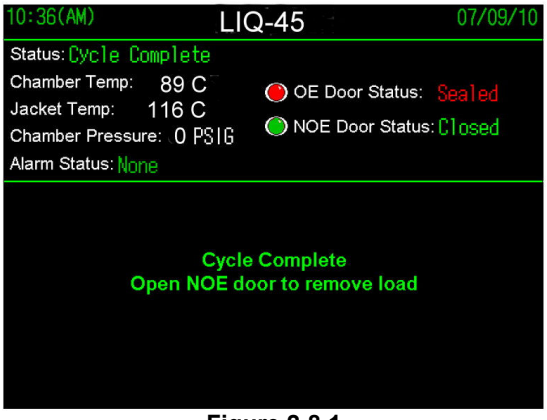

Figure 2-8.1

Section 3: Alarm Screens

Use this section of the manual to become more familiar with the alarm screens associated with the sterilizer.

3.1 General Information

Alarm screens notify the operators and technicians when the sterilizer is experiencing a condition which is not normal. Alarm screens can occur “out-of-cycle” or “in-cycle”. Not all “in-cycle” alarms will abort the cycle. A non-aborting alarm “in-cycle” will simply show up in the alarm status section of the status bar (figure 3-1). Aborting “in-cycle” alarms will display an alarm screen (figure 3-1.2) accompanied by an audible tone. Follow on screen instructions for all alarm screens. If you are unable to clear the alarm condition, consult your department supervisor or a service technician.

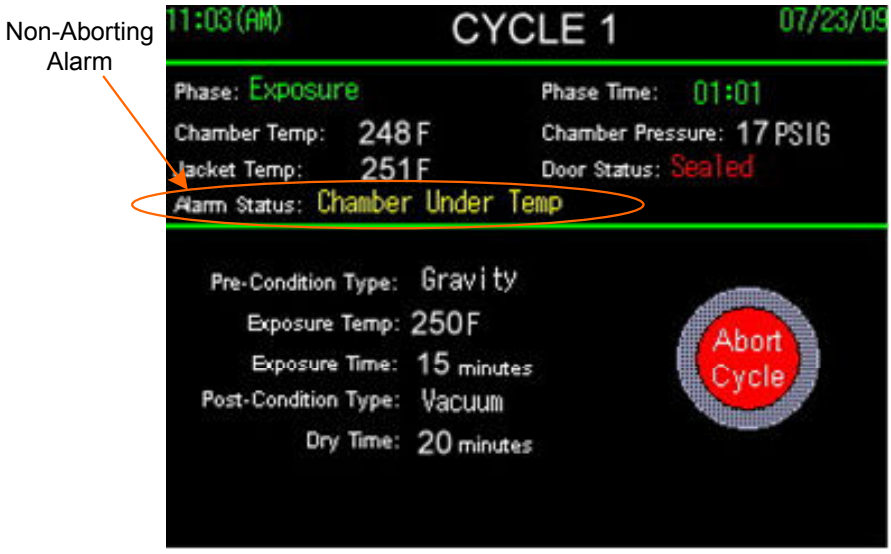

Figure 3-1

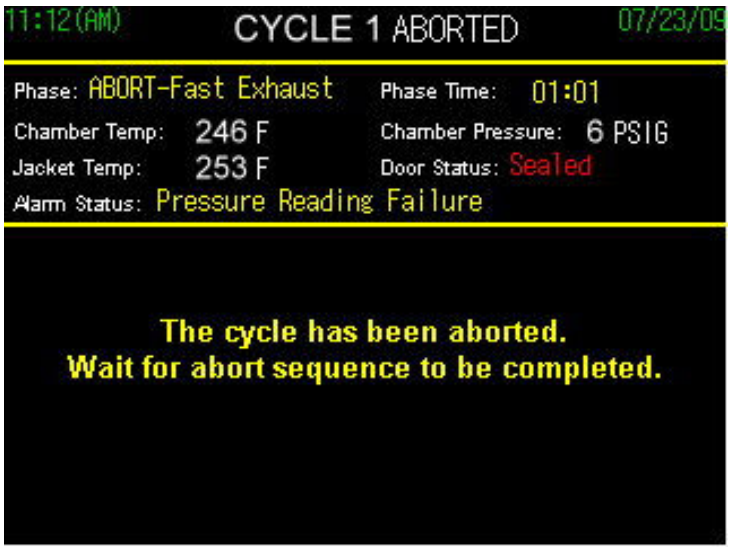

Figure 3-1.2

Section 4: Printouts

Use this section of the manual to become more familiar with the cycle report printouts associated with the sterilizer.

4.1 General Information

The cycle report prints useful information about each cycle the sterilizer runs. Cycle reports print at the end of the cycle after the door has been opened. The report will either automatically print or ask the user if they wish to print depending on the printer settings (section 2.3). Status lines on the printout shows the time, chamber temperature and chamber pressure at the moment the data was captured. Each status line also begins with a phase code. The phase code indicates which phase of the sterilization cycle the cycle was in the moment the data was captured. The printout also prints a load number. Each load number prints in the following format: a two digit month (ex: April = 04), a two digit day (ex: third day of the month = 03), a two digit year (ex: 2009 = 09), a two digit daily cycle count (ex: second cycle of the day = 02). For our example, the completed load number would be 04030902. The load number is a unique identifying code. Refer to figure 4-1 for an example of a typical printout:

---------- Cycle 1----------	(Cycle Name)

Cycle Start at 1:43:21P on 2/19/09	(Cycle Start at and on)
Precond = Gravity	(Precondition Type)
Exp. Temp = 250 F	(Exposure Temp)
Exp. Time = 5 min	(Exposure Time)
Postcond = Vacuum	(Postcondition Type)
Dry Time = 3 min	(Dry Time)
Load # 02190902	(Load Number)
----------	(Phase, Time, Chamber Temp, Chamber Pressure)
DS 1:43:31 187.2 1P	(End of Seal Door)
PU 1:44:31 232.4 10P	(End of Purge)
H1 1:46:02 245.2 14P	(End of Heating Up 1)
H2 1:46:25 250.1 16P	(End of Heating Up 2)
EX 1:48:25 251.8 17P	(2 min. Exposure)
EX 1:50:25 251.2 17P	(2 more min. Exposure)
EX 1:51:25 252.1 18P	(End of Exposure)
FE 1:51:58 221.9 2P	(End of Fast Exhaust)
VD 1:53:58 192.2 13V	(2 min. into Vacuum Dry)
VD 1:54:58 173.6 20V	(End of Vacuum Dry)
EQ 1:55:28 171.4 2V	(End of Equalization)
Z 1:55:58 162.3 0P	(Cycle Complete)

Figure 4-1

Section 5: Service Mode

Use this section of the manual to become more familiar with the service mode screens associated with the sterilizer.

5.1 General Information

Service screens allow your service technicians to test inputs and outputs, calibrate temperature and pressure readings, and reset alarms. The “Reset Alarms” pad is a good tool to use if the system has become unstable. The service screens are designed to help servie technicians troubleshoot mechanical and control problems as well as verify that the machine is in proper working condition. The service mode menu screen (Fig. 5-1) can be accessed from the main menu. A password of at least maintenance level is required to access service mode.

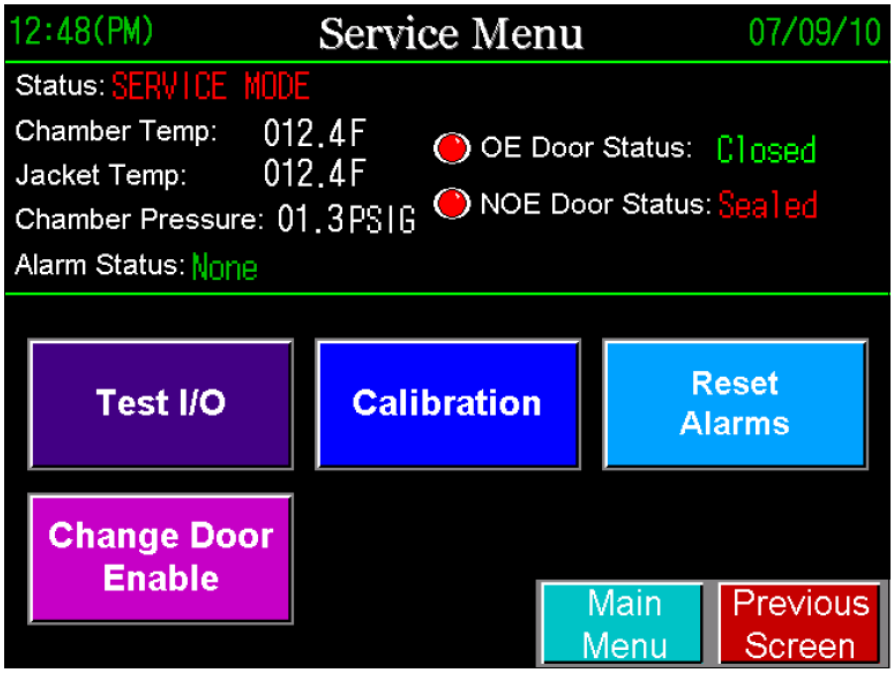

Figure 5-1

5.2 Test I/O Screen

The Test I/O screen (Fig. 5-2) allows the technician to test inputs and outputs. Pressing the desired output will turn on the output and turn the selected pad from red to green. Please note that some outputs are protected and even though they turn green the output may not turn on (i.e. S2 will not turn on unless both doors are sealed). This screen also allows the techinician to see which inputs are open (black) or closed (red) and provides a visual way to test the inputs.

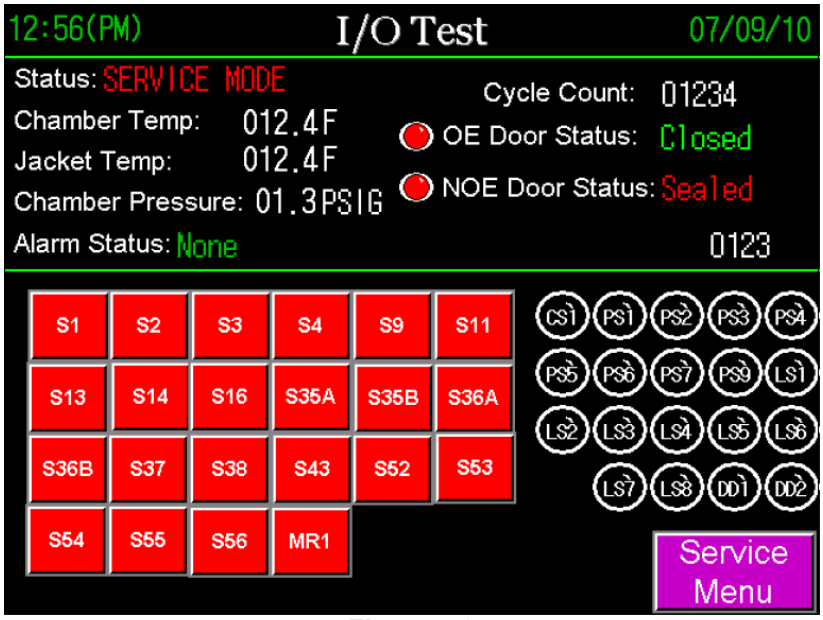

Figure 5-2

5.3 Calibration Menu

The Calibration Menu screen (Fig.5-3) is where the technician can decide which device to calibrate. Chamber pressure, temperature and jacket temperature are able to be calibrated from the control. The calibration menu is also where the technician can choose to use the same calibration data for the jacket and chamber temperature readings.

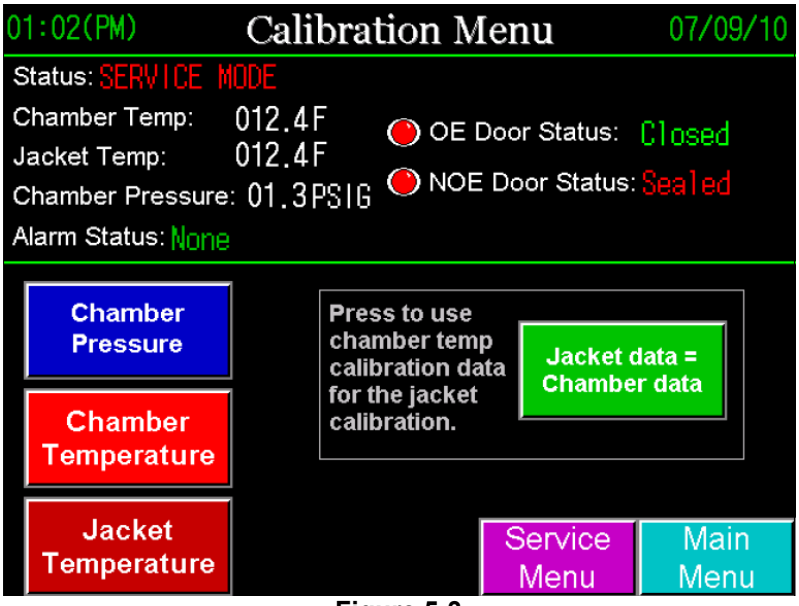

Figure 5-3

5.4 Calibration Screens

There are three calibration screens (chamber pressure, chamber temperature (Fig. 5-4) and jacket temperature). Each look the same. Use the Calibration Instructions provided to perform the calibration.

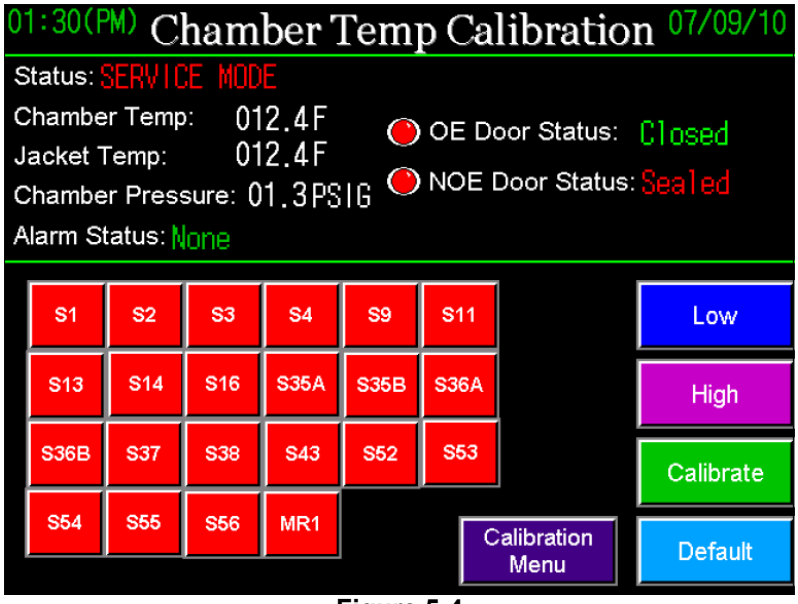

Figure 5-4

CALIBRATION

This section includes instructions for calibrated the pressure and temperature readings of the Encore Sterilizer. Pressure and temperature calibration should be checked periodically, and whenever either the PLC, A/D Module, pressure or temperature sensors are replaced. Temperature adjustments do not affect the pressure calibration.

1.0 PRESSURE CALIBRATION

1. Install a calibrated pressure gauge at the plugged fitting next to the Chamber Pressure Transducer.
2. Enter Service Mode from the Main Menu. A password of at least Maintenance Level will be required.
3. Press Calibration and then Pressure, then press Chamber Pressure.
4. Turn on solenoid S9 and wait for jacket pressure to achieve 20 PSIG then turn off S9.
5. With door open, press LOW then press OK.
6. Close both chamber doors.
7. Turn on solenoid S35A and 36A and wait 30 seconds.
8. Turn on solenoids S1, S2, S3, S4, S13, S16, and wait for 4 minutes.
9. After about 4 minutes, turn off solenoids S3 and S4
10. Once the pressure in the chamber reaches 30 – 34 PSIG press HIGH and enter the value from the calibrated gauge. Press OK.
11. Press CALIBRATE and select OK.
12. Exhaust the chamber by turning off solenoids S2, S13 and turning on solenoids S3, S4.

13. Unseal OE door by turning off S35A and turning on S35B, S37, S43 and MR1.
14. If you wish to restore calibration to default values press DEFAULT.

2.0 CHAMBER TEMPERATURE CALIBRATION

1. Install a calibrated temperature reading device at the plugged fitting next to the chamber rtd.
2. Enter Service Mode from the Main Menu. A password of at least Maintenance Level will be required.
3. Press Calibration and then Chamber Temperature.
4. Turn on S9 and wait for jacket pressure to achieve 20 PSIG then turn off S9.
5. With door open press LOW. Enter the value from your calibrated device, then press OK.
6. Close both chamber doors.
7. Turn on solenoids S35A, S35BS and wait 30 seconds.
8. Turn on solenoids S1, S2, S3, S4, S13, S16, and wait for 4 minutes.
9. After about 4 minutes, turn off solenoids S3, S4.
10. Once the pressure in the chamber reaches 30 – 34 PSIG press HIGH and enter the value from the calibrated device. Press OK.
11. Press CALIBRATE and select OK.
12. Exhaust the chamber by turning off solenoids S2, S13 and turning on solenoids S3, S4.
13. Unseal OE door by turning off S35A and turning on S35B, S37, S43 and MR1.
14. If you wish to restore calibration to default values press DEFAULT.

3.0 JACKET TEMPERATURE CALIBRATION

1. To use Chamber Temperature calibration values enter Service Mode, then press Calibration, then press Jacket Data = Chamber Data. (recommended). Then exit the calibration menu.
2. To calibrate the jacket independent from the chamber first make sure steam is off and jacket pressure is 0.
3. Install a calibrated temperature reading device at the plugged fitting next to the jacket rtd.
4. Enter Service Mode from the Main Menu. A password of at least Maintenance Level will be required.
5. Press Calibration and then Jacket Temperature.
6. Press LOW. Enter the value from your calibrated device, then press OK.
7. Turn on solenoid S9.
8. Once the pressure in the jacket reaches 30- 34 PSIG press HIGH and enter the value from the calibrated device. Press OK.
9. Press CALIBRATE and select OK.
10. Turn off solenoid S9.
11. If you wish to restore calibration to default values press DEFAULT.